

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1 and 3-6 are now active in this application. Claims 7 and 8 are withdrawn, and claim 2 is canceled. Claim 1 is herein amended to include the subject matter of claim 2. No new matter is added. Claims 3, 5, and 6 are amended to correct improper dependencies.

In the outstanding Office Action, Claims 1, 3, and 4 were rejected under 35 U.S.C. §102(b) as anticipated by Ito, EP1146569. Claims 1-4 were rejected under 35 U.S.C. §102(b) as anticipated by De Francesco, U.S. Patent No. 5,733,511. Claim 2 was rejected under 35 U.S.C. §103(a) as obvious over Ito in view of De Francesco. Claim 5 was rejected under 35 U.S.C. §103(a) as obvious over Ito in view of Pote, U.S. Patent No. 5,239,134. Claim 5 was also rejected under 35 U.S.C. §103(a) as obvious over De Francesco in view of Pote. Claim 6 was objected to under 37 CFR 1.75(c) as being an improper dependent claim.

Claims 1, 3, and 4 were rejected under 35 U.S.C. §102(b) as anticipated by Ito. In response, applicants have amended claim 1 to include the limitations of claim 2. Claim 1, as amended, is directed to a method for plasma-enhanced chemical vapor deposition. In the method, a discharge electrode and a substrate are disposed opposite to each other in a vacuum film formation chamber into which a gas for forming a film containing a substance has been introduced. High-frequency electric power generated by a high-frequency electric power feeding circuit is fed to a plurality of feeding points provided to the discharge electrode through a plurality of external cables which are disposed outside the vacuum film formation chamber and then through a plurality of internal cables which are disposed inside the vacuum film formation chamber and which correspond with the external cables, respectively, so as to generate plasma between the discharge electrode and the substrate to vapor deposit the

substance on the substrate. The method comprises adjusting phases of the high-frequency electric power at the feeding points by changing electrical characteristics of the external cables, with the high-frequency electric power being fed to the plurality of feeding points. The phases of the high-frequency electric power at the feeding points, the high-frequency electric power being fed to the plurality of feeding points, are adjusted by carrying out vapor deposition with changes in the electrical characteristics of the external cables, carrying out observations of the condition of the substance which has been vapor deposited on the substrate, and changing the electrical characteristics of the external cables on the basis of the observations. Ito does not teach or suggest adjusting the phases of the high-frequency electric power by changing the electrical characteristics of the external cables. Failing to teach or suggest all of the elements of claim 1, Ito cannot anticipate claim 1. Applicants respectfully request withdrawal of this rejection.

Claims 1-4 were rejected under 35 U.S.C. §102(b) as anticipated by De Francesco. As noted above, claim 2 is canceled, and claim 1 is amended to include all of the limitations of claim 2. As amended, claim 1, from which claims 3 and 4 depend, is directed to is directed to a method for plasma-enhanced chemical vapor deposition. In the method, a discharge electrode and a substrate are disposed opposite to each other in a vacuum film formation chamber into which a gas for forming a film containing a substance has been introduced. High-frequency electric power generated by a high-frequency electric power feeding circuit is fed to a plurality of feeding points provided to the discharge electrode through a plurality of external cables which are disposed outside the vacuum film formation chamber and then through a plurality of internal cables which are disposed inside the vacuum film formation chamber and which correspond with the external cables, respectively, so as to generate plasma between the discharge electrode and the substrate to vapor deposit the substance on the substrate. The method comprises adjusting phases of the high-frequency

electric power at the feeding points by changing electrical characteristics of the external cables, with the high-frequency electric power being fed to the plurality of feeding points. The phases of the high-frequency electric power at the feeding points, the high-frequency electric power being fed to the plurality of feeding points, are adjusted by carrying out vapor deposition with changes in the electrical characteristics of the external cables, carrying out observations of the condition of the substance which has been vapor deposited on the substrate, and changing the electrical characteristics of the external cables on the basis of the observations. De Francesco cannot anticipate claim 1 or its dependent claims.

In the outstanding Office Action, the Office states that claim 2 is anticipated by De Francesco because the reference teaches modifying electrical characteristics of external cables based on plasma conditions in order to make more uniform plasma. However, Applicants' respectfully disagree. De Francesco merely relates to "devices and methods for supplying power to electrodes in plasma reactor systems" (Field of the Invention), and discloses nothing about chemical vapor deposition of any kind, let alone plasma-enhanced chemical vapor deposition. This is evidenced by the fact that De Francesco's object is not to form a film of a uniform thickness of deposition, but "to provide a plasma reactor electrode arrangement which creates a large active electrode are which has uniform plasma properties over the extent of the surface of the electrode" (Col. 1, line 66 through col. 2, line 3) using an "RF power distribution device and method utilizing $\frac{1}{4}$ wavelength transmission lines engaged to each of a plurality of powered electrodes such that power to each electrode is equalized" (Col. 1, lines 12-17). Further, failing to teach or suggest anything about any kind of deposition, the steps of "carrying out observations of the condition of the condition of the substance which has been vapor deposited on the substrate, and changing the electrical characteristics of the external cables on the basis of the observations" as recited in the original claim 2 and now incorporated into claim 1, are not taught or suggested. Failing to

teach or suggest all of the elements of claim 1, De Francesco cannot anticipate claim 1 or its dependent claims. Applicants' respectfully request the withdrawal of these rejections.

Claim 2 was rejected under 35 U.S.C. §103(a) as obvious over Ito in view of De Francesco. Applicants have canceled claim 2, and included its limitations in claim 1. Applicants respectfully submit that claim 1, as amended, is not obvious over Ito in view of De Francesco.

Claim 1 is directed to a method for plasma-enhanced chemical vapor deposition. The method comprises adjusting the phases of the high-frequency electric power at the feeding points by carrying out vapor deposition with changes in the electrical characteristics of the external cables, carrying out observations of the condition of the substance which has been vapor deposited on the substrate, and changing the electrical characteristics of the external cables on the basis of the observations.

Ito is directed to a thin film forming method. While Ito discloses a method that comprises modification of the external cables, Ito does not teach a method including such a modification in response to observations of the condition of the substance which has been vapor deposited on a substrate. Moreover, as noted by the Office, Ito includes modifying the external cables, but not the electrical characteristics based on the plasma conditions.

De Francesco discloses a method for uniform plasma distribution. However, De Francesco does not remedy the deficiencies of Ito. Like Ito, De Francesco teaches nothing about any modification in response to observations of the condition of the substance which has been vapor deposited on a substrate. Indeed, De Francesco does not relate to chemical vapor deposition at all. A claimed invention can only be found obvious if there is "some articulated reasoning with some rational underpinning to support the legal conclusion of

obviousness.” *KSR Int’l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Moreover, every word in a claim must be considered in determining the question of patentability against the prior art. *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970). The cited references do not together teach all of the elements of claim 1, and the Office has not offered any rational reason why one skilled in the art would combine the recited references to reach the claimed invention. Accordingly, the combination of Ito with De Francesco cannot render claim 1, or any of the claims depending therefrom, obvious. Applicants respectfully request withdrawal of this rejection.

Claim 5 was rejected under 35 U.S.C. §103(a) as obvious over Ito in view of Pote. As noted by the Office, Pote teaches making a coaxial cable and modifying the dielectric constant so that the phase propagation of the cable, etc., is more easily controllable. But Pote does not remedy the deficiencies of Ito. Neither of the references teach anything about modification of the electrical characteristics of as cable in response to observations of the condition of the substance which has been vapor deposited on a substrate. The cited references do not together teach all of the elements of claim 5, and the Office has not offered any rational reason why one skilled in the art would combine the recited references to reach the claimed invention. Accordingly, the combination of Ito with De Francesco cannot render claim 5 obvious. Applicants respectfully request withdrawal of this rejection.

Claim 5 was also rejected under 35 U.S.C. §103(a) as obvious over De Francesco in view of Pote. As noted above, neither of these references relate to chemical vapor deposition. Neither teach or suggest anything about modification of external cables in response to observations of the condition of the substance which has been vapor deposited on a substrate. Failing to do so, the cited references do not together teach all of the elements of claim 5, and the Office has not offered any rational reason why one skilled in the art would combine the recited references to reach the claimed invention. Accordingly, the combination of De

Application No. 10/518,371
Reply to Office Action of August 5, 2008

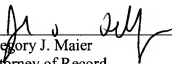
Francesco with Pote cannot render claim 5 obvious. Applicants respectfully request withdrawal of this rejection.

Claim 6 was objected to under 37 CFR 1.75(c) as being an improper dependent claim. In response, claim 6 is amended to be dependent from only claim 1. Applicants respectfully request withdrawal of this objection.

In light of the above discussion, the present application is believed to be in condition for allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/07)

John D. Dellinger
Registration No. 50,436